

What is claimed is:

1. Isolated nucleic acid comprising DNA having at least a 95% sequence identity to (a) a DNA molecule encoding a *patched-2* polypeptide comprising the sequence of amino acids 1 to about 1203 of Fig. 1 (SEQ ID NO:2), and encoding a polypeptide having *patched-2* biological activity.

2. An isolated nucleic acid comprising DNA having at least a 95% sequence identity to (a) a DNA molecule encoding the same mature polypeptide encoded by the cDNA in ATCC Deposit No. 209778 designation; or (b) the complement of the DNA molecule of (a).

3. The isolated nucleic acid of Claim 5 comprising human *patched-2* encoding sequence of the cDNA in ATCC deposit No. 209778 designation; or a sequence which hybridizes thereto under stringent conditions.

4. A vector comprising the nucleic acid of Claim 1.

5. The vector of Claim 4 operably linked to control sequences recognized by a host cell transformed with the vector.

6. A host cell transformed with the vector of Claim 4.

7. The host cell of Claim 6 which is mammalian.

8. The host cell of Claim 7 wherein said cell is a CHO cell.

9. The host cell of Claim 6 which is prokaryotic.

10. The host cell of Claim 9 wherein said cell is an *E. coli*.

11. The host cell of Claim 7 wherein said cell is a yeast cell.

12. The host cell of Claim 11 which is *Saccharomyces cerevisiae*.

13. A process for producing *patched-2* polypeptides comprising culturing the host cell of Claim 9 under conditions suitable for expression of vertebrate *patched-2* and recovering *patched-2* from the cell culture.

14. Isolated native sequence human *patched-2* polypeptide comprising amino acid residues 1 to 1203 of Fig. 1 (SEQ ID NO:2).

15. Isolated native sequence human *patched-2* polypeptide encoded by the nucleotide deposited under accession number ATCC 209778 Designation having *patched-2* biological activity.

16. A chimeric molecule comprising vertebrate *patched-2* polypeptide patched-2 to a heterologous amino acid sequence.

17. The chimeric molecule of Claim 16 wherein said heterologous amino acid sequence is an epitope tag sequence.

18. The chimeric molecule of Claim 17 wherein said heterologous amino acid sequence is a constant region of an immunoglobulin.

19. An antagonist of *patched-2* which blocks, prevents, inhibits and/or neutralizes the *Dhh* function in the *Dhh* signaling pathway.

20. The antagonist of Claim 19 which is a small bioorganic molecule.

21. The antagonist of Claim 19 which is an antisense nucleotide.

22. An agonist of *patched-2* with stimulates or enhances the normal functioning of *patched-2* in the *Dhh* signaling pathway.

23. The agonist of Claim 22 which prevents *Smo* (SEQ ID NO:17) inactivation of *Ptc-2* (SEQ ID NO:2).

24. The agonist of Claim 22 which is a small bioorganic molecule.

25. The agonist of Claim 24 which is a small bioorganic molecule.

26. A method of screening for antagonists or agonists of *patched-2* biological activity comprising:

- (a) exposing *patched-2* expressing target cells in culture to a candidate compound and *Dhh*; and
- (b) analyzing cells for binding of *Dhh* to *patched-2*; or
- (c) scoring phenotypic or functional changes in the treated cells;

and comparing the results to control cells which were not exposed to the candidate compound.

27. A method of screening for antagonist or agonist molecule of *patched-2* biological activity comprising:
- (a) exposing a *patched-2* ligand and a compound having *patched-2* biological activity to a candidate antagonist or agonist; and
  - (b) analyzing the substrate for binding of the ligand to the compound; and
- comparing the results to control reactions which were not exposed to the candidate molecule.

28. A method of diagnosing to determine whether a particular disorder is modulated by *Dhh* signaling, comprising:

- (a) culturing test cells or tissues;
- (b) administering a compound which can inhibit *patched-2* modulated *Dhh* signaling; and
- (c) analyzing the level of *Dhh* binding to *patched-2* or *Dhh* mediated phenotypic effects in the test cells.